INSECT CONTROL
HELENA NATIONAL FOREST

May 28th.,1923

(3 copies sent Helena
1 " " Forester)

Helena, Montana

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Insect Control
Helena

May 28, 1923

MEMORANDUM

Hunters Gulch Insect Control Area.

Work on this project was initiated in accordance with recommendations made in a report submitted by the Forest Insect Field Station at Coeur d'Alene, Idaho under date of December 10, 1922. Reference is made to that report.

The project is situated on the south half of Sec. 17, north half of Sec. 20, and the NE¼ of the NE¼ of Sec. 19, T. 13 N., R. 1 W. in Hunters Gulch.

The area is one of fairly good soil with an average slope of about 30 degrees on a general northwesterly exposure at altitudes ranging from approximately 6000 to 7000 feet. With the exception of a narrow strip around the upper edges the entire area is an excellent lodgepole pine site for this region.

A tally of live trees 6 inches D. B. H. and larger on quarter acre sample plots gives 91% lodgepole pine and 9% Douglas fir based on number of trees. The forest floor is remarkably clean with almost no down timber and but a very few young trees, mostly fir. The lodgepole stand is remarkably sound, smooth, and clear and is 130 to 140 years old and of even age except a very narrow strip along Hunters Creek that is 90 to 100 years old. Many borings were taken in the dominant and codominant trees. The outside inch shows from 35 to more than 50 rings with an average of 40 rings in the last inch of radius for all of the 38 recorded borings taken. The stand is mature and the beetles are harvesting some of the dominant and codominant trees ranging from 8 inches to 21 inches in diameter with an average of 12 inches.

The sample plots show an average of but 8 trees per acre 6 inches D. B. H. and larger dead from causes believed to be other than insects. A careful 2½% estimate by the quarter acre circular plot method gives a stand of 3 M feet B. M. per acre in trees 10 inches D. B. H. and larger utilized to a 6 inch top. The trees average 2½ logs tall and will run about 35 logs per M. There are many 10 inch and 11 inch trees.

Of the trees attacked by the mountain pine beetle (Dendroctonus Monticolae) in 1922 and treated in this project 54% were listed as dominant, 25% as codominant, 8% suppressed and 13% decadent. Nearly all of the decadent trees were spike topped, possibly from earlier attacks by other insects. There is absolutely no exterior indication of any fungus disease on the lodgepole except a very little Peridermiun and but one of the 38 trees bored was slightly red hearted. It had not yet begun to break down or show any white streaks. This is a remarkably sound body of timber for its age. Possibly this is because it is rather completely isolated from other stands of mature lodgepole timber and surrounded with nearly pure stands of Douglas fir for considerable distances .

It seems probable that the climax type in this locality is Douglas fir. Immediately adjoining this stand on another slope of the same hill is a 110 year pure stand of Douglas fir which has succeeded a former Douglas fir stand destroyed by fire.

Due to the clean stands and the dearth of either living or dead ground cover beneath the stands the fire risk in Hunters Gulch is very low although there is evidence of lightning on the higher ridges. The fire risk will be somewhat increased if considerable numbers of trees are killed by insects.

As nearly as could be determined by the examination made in connection with this project the present infestation originated in 1920 although it is of course not possible to state definitely that no Dendroctonus were present on the area prior to that date. It seems quite clear that more trees were attacked in 1921 than in 1920 and that there was a still greater increase in the number of trees attacked in 1922. It is estimated that the number of trees attacked in 1922 was approximately double the number attacked in 1921. What the history of the infestation would have been had no control been undertaken cannot be stated with assurance but it seems reasonable to believe that the beetles would have continued to harvest the mature and decadent trees in increasing numbers.

At the date of this examination the 1922 attack had received a very serious check through the highly effective work of woodpeckers, presumably the Rocky Mountain Hairy Woodpecker. It is estimated that at the time of this examination 80% of last years crop of larvae had either been eaten or subjected to fatal desication by the work of the woodpeckers. The woodpeckers in their work removed much of the outer layers of bark and so opened up the remainder with small holes that severe drying out resulted. On a great many trees nearly all of the bark from a point about 2 feet above ground had been removed and virtually every infested tree showed evidence of more or less woodpecker work. In nearly all cases infected trees were more easily identified by woodpecker work than by any other mark. There was very little discoloration of the foliage of trees attacked in 1922 and they could be successfully located only by proximity to red topped trees attacked in 1921 or by an intensive cruise of the area.

A normal number of predatory insect enemies of the beetles were noted in their galleries.

Due to the activities of natural enemies, principally woodpeckers, and to what appears to have been the effect of rather severe climatic conditions and thin bark on the upper part of the trees, control work was greatly lightened and after careful consideration it was deemed necessary to remove the bark only to an average height of about 5 feet from the ground. With the exception of about 10 individuals the trees were left standing. Most of the live broods and by far the most thrifty appearing individuals were found in the lower two feet of the tree although in a few cases it was found necessary to go as high as 10 or 12 feet. The insects were in the stage of half to two thirds grown larvae.

Both axes and bark spuds were used in the work of peeling and it is not possible to state at this time which tool is preferable. Probably the two should be used together.

The peeling was done by a crew of 6 to 8 men directed by Ranger Barrick. The men were not skilled in work of this kind and showed a tendency to increase their speed with added experience. Due to the small size of the area and the open character of the stand but little time was lost in travel.

Scouting and marking of trees to be treated was done by Messrs. Evenden, Rust, Brandborg, and Flint. From the standpoint of economy it is highly important that this work be carried on well in advance of the actual control

work. All trees marked were tallied by D. B. H. crown condition and method of treatment as indicated on the attached sample tally sheets. At least one tree in each group was examined with an increment borer to determine rate of growth, age, and soundness and complete records of the data so obtained were made in the field.

The cost of the work on a per tree basis or a unit of area or volume basis was high because of travel time and expense and transportation involved in putting on a crew for so small a project.

Costs are tabulated below:

		Total Cost
Supplies		77.78
Transportation of supplies and equipment including stage fare of three men		55.23
Packing	Man Hours	51.50
Non-effective time of control crew including making and breaking camp, travel, cook, and flunky, etc.	24¾ da @ $3 6¾ da @ 4.25	102.94
Actual time on control work 25 man days at $3		75.00
Rangers time in preparation, packing and supervision, 9 man days		36.50
Cost per meal		.35
Cost per meal including cook and flunkie		.49
Cost per tree treated for labor (500 trees)		.15
Cost per tree treated for labor and supplies		.23

It is not practicable to calculate the cost of overhead time of Bureau of Entomology and Forest officers other than the ranger because a large part of such time was spent in studies, photography, examination of other areas, timber estimate, etc. Only the figures dealing with man hours spent in actual control and those dealing with cost of supplies are of value in estimating the probable cost of future projects.

A map of the area and a list showing the numbers of the trees in each of the groups indicated on the map are attached. The original tally sheets are filed in the Supervisor's office.

Group Number	
1	1 to 17 inclusive
2	2 to 35 inclusive
3	36 to 100 inclusive
4	101 to 213 inclusive
5	214 to 216 inclusive
6	217 to 243 inclusive
7	244 to 254 inclusive
8	255 to 294 inclusive
9	295 to 311 inclusive
10	312 to 348 inclusive
11	349 to 375 inclusive
12	376 to 390 inclusive
13	391 to 411 inclusive
14	412 to 431 inclusive
15	432 to 451 inclusive
16	452 to 457 inclusive
17	457 to 470 inclusive

Scattered 27 trees.

JIM BALL BASIN.

An examiniation was made of the lodgepole pine stands surrounding this basin by Messrs. Brandborg, Evenden, Rust, and Barrick on May 24, 1923. The infestation in these stands is a normal one and a very small percent of the volume is being killed each year by the mountain pine beetle. The infested trees are scattered over a large area, and are very difficult to locate as there is no discoloration of the foliage at this time. Woodpeckers have destroyed a large percent of the broods as in the Hunters Gulch region.

It was decided that control work on a large scale would not be justified, yet it was believed that as one man could locate and treat a very large percent of the infested trees in the next two weeks, that it would be worth while to have this work done as an experiment in maintenance control. Therefore it is recommended that a temporary laborer be stationed at the Conway Ranger Station with instructions to locate and treat as many of the infested trees as possible. A record of the number of trees treated, their D. B. H. and location should be kept. This work should continue until June 10th.

MAGPIE GULCH AREA

This area was examined by Messrs. Brandborg and Evenden on May 27, 1923. On the Magpie side of the divide between Magpie and Hellgate there is a stand of lodgepole pine of approximately 2,000 M feet B. M. on an area of 600 acres. During the past few years there has been considerable loss of timber due to the attacks of the mountain pine beetle. Time was not available for any thorough cruise of this region, but it is estimated that there are at least 100 trees which contain live broods at this time. The conditions, with reference to the woodpecker work, are parallel with those in Hunters Gulch where control work was carried on. Because of the value of having a check area similar to the area in which control work is instituted, it is recommended that the Magpie Gulch area be left, for at least one year, as a check against the results obtained by the preventative measures used in checking the epidemic in Hunters Gulch.

BEAR GULCH AREA

The area along the lower part of Bear Gulch and on the ridge westerly from Bear Gulch was examined by Messrs. Rust and Flint. The stand here is a mature to

decadent open yellow pine stand 300 to 400 years old with considerable young growth of all ages in mixture. The soil is very shallow and the southerly exposure makes the site a very severe one.

A few trees are dying from causes that cannot be definitely ascertained. A number of weakened and badly decadent trees have been attacked in 1921 and 1922 by a secondary bark beetle of the genus Ips. A careful examination revealed but two trees attacked by the mountain pine beetle. One of these trees affected near the base only was treated at once by the examiners. The other was marked for cutting and peeling. The bark beetles in these trees were well advanced in the pupa stage.

The problem in this stand is one of possible utilization. Many of the trees are very defective and considerable loss in them is to be expected even if insects are kept out. This area should be kept under observation but no special control measures on it are necessary unless bark beetles become much more active than at present. Measures to control the Ips are not considered necessary because they do not do sufficient damage to warrant the outlay.

Future work on these areas should consist of a thorough examination in the fall of 1923 followed by such action as the findings at that time suggest.

Submitted by James L. Evenden.
ENTOMOLOGIST

MAY 30 1923

HRF.

Approved A. H. Abbott
FOREST SUPERVISOR

UNITED STATES DEPARTMENT OF AGRICULTURE—FOREST SERVICE

Land District. Mag. Declin. Area 206 Acres

INSECT CONTROL Sec's 17, 18 19-20 T. 13 N. R. 1 W Mer. Scale 4 inches = 1 mile
(Case designation.) (Subdivision and section.)

HELENA

HUNTER GULCH AREA

Area in Secs. 17 & 19 - 92 A.
Area in Sec. 20 - 114 A.
Total Area 206 A.

(2) Areas on which Control Measures were Taken.

Field work by FLINT, Date 5-24-28, Platted by

Remarks: HUNTERS GULCH INSECT CONTROL Area Controlled 206 A

Approved , 19 , (Approving officer.)

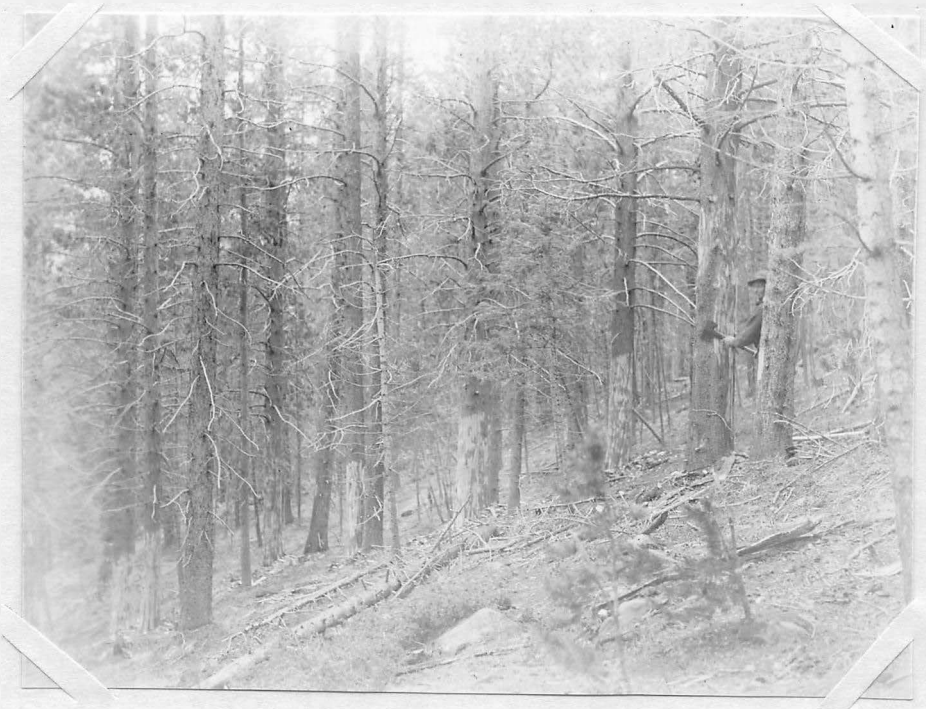
Form 6786
(Revised April, 1930)

PHOTOGRAPHIC SECTION

Control camp at lower edge of infested lodgepole pine stand at head of Hunters Gulch.

View showing opening in lodgepole pine stand looking across Hunters Gulch, with treated trees in foreground.

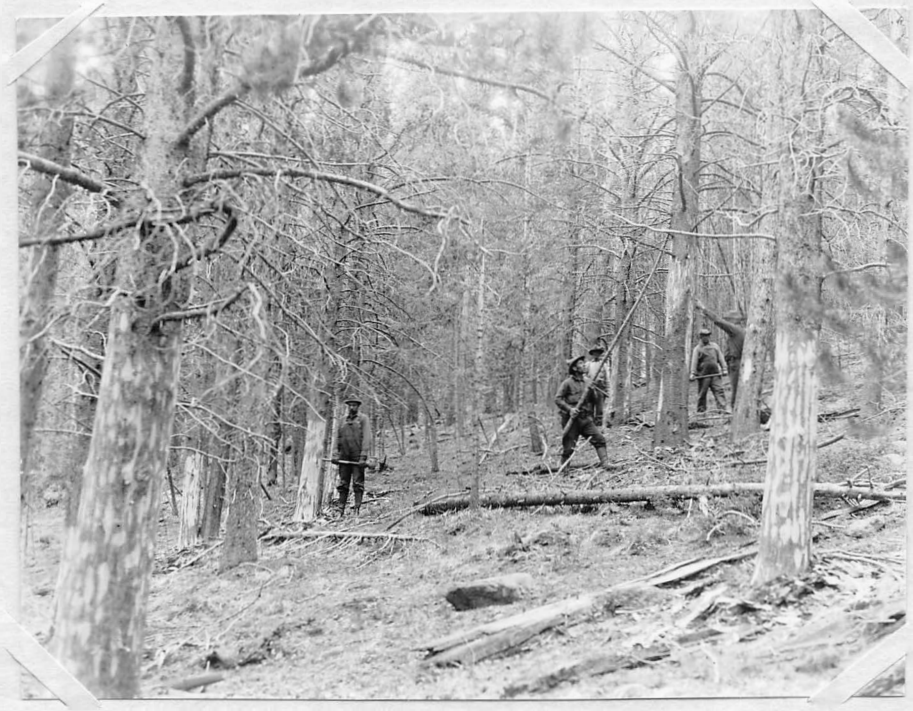
A majority of the infested trees were found around edges of these park like openings. Group number three.



A near view of lodgepole pine stand showing slope and clean forest floor, also trees marked for treatment and a number of peeled trees.

A near view of peeling infested trees.

Sharp double-bitted axes were used to advantage on thin barked trees.



View showing long-handled peeling spud in use.

View showing method of charring bark on bole of large trees which were felled when infested portion was very limby and beyond reach of the peeling tools.